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ABSTRACT

A program was developed for improving the reading skills of 22 first-grade bilingual students in a suburban K-6 elementary school located northwest of Chicago. The problem was detected because the first grade bilingual students had not achieved reading fluency at the conclusion of the academic school year and, consequently, did not exhibit strong reading comprehension skills. Traditional instruction methods were not meeting the needs of the targeted students. Inappropriate reading instruction for the learning styles of the students, a developmental delay of the children's oral language, limited exposure to printed materials and lack of reading practice were the major causes identified. The solution strategies selected to meet the needs of this population included the whole language approach combined with principles of the learning styles movement. The chosen interventions were designed to develop oral language, emergent literacy, automatic word recognition, to improve reading fluency and comprehension skills. The intervention was intended to help first-grade bilingual students have a solid ground for the reading process through their own style of acquisition of knowledge. This would empower them to make the transition to the second language. The problem was reduced. Students improved in the specified areas where interventions were applied. Oral language was the key element through which students evidenced that comprehension was acquired. (Contains 42 references, 4 tables, and 3 figures of data. An appendix describing how to produce "gel boards" and two appendixes of data are attached.) (Author/RS)

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IMPROVING READING SKILLS THROUGH TACTILE AND KINESTHETIC STRATEGIES WITHIN A WHOLE LANGUAGE APPROACH

by

Maria Valdez

Submitted in partial fulfillment of the requirements for
the degree of Master's of Arts in Education

Saint Xavier University - IRI
Field-Based Master's Program

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Action Research Final Report
Site: Wheeling, IL
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Dedicated to R.W.W. who gave me confidence, encouragement, and time to work on the research.

A special thanks to Pat.

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Abstract

AUTHOR: Maria C. Valdez SITE: Wheeling
DATE: April, 1994

TITLE: Improving Reading Skills Through Tactile and Kinesthetic Strategies Within a Whole Language Approach

ABSTRACT: This project describes a program to improve the reading skills of first grade bilingual students in a suburban K-6 elementary school located northwest of Chicago. The problem was detected because the first grade bilingual students had not achieved reading fluency at the conclusion of the academic school year and consequently, did not exhibit strong reading comprehension skills.

It appeared that the traditional instruction methods were not meeting the needs of the targeted students. Inappropriate reading instruction for the learning styles of the students, a developmental delay of the children's oral language, limited exposure to printed materials and lack of reading practice were the major causes identified.

The solution strategies selected to meet the needs of this population include the whole language approach combined with principles of the learning styles movement. The chosen interventions were designed to develop oral language, emergent literacy, automatic word recognition, to improve reading fluency and comprehension skills. The intervention was intended to help the first grade bilingual students have a solid ground for the reading process through their own style of acquisition of knowledge. This would empower them to make the transition to the second language.

The problem was reduced. There was improvement in the specified area where interventions were applied. Oral language was the key element through which students evidenced that comprehension was acquired.

Chapter I

STATEMENT OF PROBLEM AND DESCRIPTION OF CONTEXT

Problem Statement

The first grade bilingual at-risk students in a suburban community exhibit problems learning to read through traditional methods of reading instruction as measured by teacher observation, standardized and teacher made tests.

Description of Immediate Problem Setting

A suburban K-6 elementary school located northwest of Chicago, Illinois has a student population of 551. This elementary school is one of three bilingual centers and one of nine K-6 elementary buildings that feed into two junior high schools.

The student population is 51.5 percent White, 1.5 percent Black, 40.3 percent Mexican-American, 6.4 percent Asian/Pacific Islander and 0.4 percent Native American. Twenty-seven point nine percent of the students are low income students with twenty-five percent of the students being limited English proficient. Limited English proficient students are those who have been tested and found eligible for Bilingual Education. Low income students are pupils from families receiving public aid or being supported in foster homes with public funds or eligible to receive free or reduced-price lunches. The attendance rate at this school is 94.9 percent. The student mobility rate is 14.4 percent. This school has no chronic truants.

The staff of this school includes; one principal, twenty-three kindergarten through sixth grade teachers four of those being bilingual teachers, two special education teachers including an assistant, one multi-media specialist and an assistant, one physical education teacher, one Chapter I reading specialist, one

part-time computer lab teacher, one full-time social worker, one full-time speech therapist, one art instructor and one music teacher. Auxiliary personnel include; one secretary, one full-time health aide, one part-time nurse and three custodians. There is a part-time psychologist and a part-time bilingual psychologist available upon request.

The Chapter I reading specialist services 50 students and the special education resource persons service 35 children daily. These teachers are also involved in serving 47 children who do not meet state guide lines for learning disability/behavior disorder resource. They conduct a morning/afternoon support group. The speech therapist has a case load of 25 students.

Description of Surrounding Community

The elementary school is part of a consolidated school district located in a northwest suburb of Chicago. The administrative staff at the district level includes; one school superintendent, one assistant superintendent, seven coordinators including one bilingual/ESL; one director of finance, support services, assessment and testing, personnel and operations. The district has a student population of 6,146. This population comes from four surrounding communities. According to the 1990 census, the average family income is $52,505. The average per capita income is $20,469. The communities' population is 86.02 percent White, 1.23 percent Black, 7.9 percent Mexican-American, 4.6 percent Asian and 0.15 percent other. As reflected by the 1990 census, 86.6 percent of the adults are high school graduates and 32.2 percent are college graduates.

The 1990 census of the school community work force reflected a total of 27,441 employed individuals of the total population of 45,150. Six point three percent of the population was unemployed, 66.2 percent were employed in

managerial-professional roles, 68.6 percent were employed in sales administration, 18.4 percent service-occupation, 2.2 percent farming-forestry, 19.6 percent production-repair and 24.8 percent operators-labor.

Statistics showed a 100 percent increase in single family housing from 1991 to 1992. In addition, eight multi-family units were built during the same time period. The village clerk of the community stated that 75 single family units were built in 1992, with 120 units being built in 1993. No data were available for the multifamily units to date. Of the available housing, 63.2 percent is owner occupied and 32.9 percent is renter occupied. During the last five years the business community has been stable at 950 business enterprises.

Regional and National Context of the Problem

The traditional methods of teaching reading have left out the at-risk students. The problem is not only seen in the community that has been described, but is a problem that has been addressed in research. Levin, and Hopfenberg (1991), Miller (1985), Carbo, Dunn and Dunn (1986), have addressed these issues in their research about at-risk students and the traditional methods of teaching reading.

According to Levin and Hopfenberg, (1991 p. 47) "The study showed that remediation, the main strategy for at-risk students actually slowed down their progress placing them farther and farther down the mainstream." In describing the educational causes of reading problems, Miller, (1998 p.12) states "Another educationally related cause of reading problems may be called inappropriate reading instruction. This generally indicates beginning reading instruction that is not compatible with a child's unique needs or weaknesses." Researchers who have been involved in assisting at-risk children have found that; "Youngsters who

cannot decode or read fluently often require repetition and varied approaches through many senses..." (Carbo, Dunn and Dunn, 1986 p. 241).

Chapter 2

PROBLEM EVIDENCE AND PROBABLE CAUSE

Problem Background

As stated in Chapter 1, the general lack of reading comprehension in bilingual students attracted national attention and concern. In 1967, the Bilingual Education Act was added to the Elementary and Secondary Education Act of 1965. The Bilingual Education Act of 1967 was a response to political pressures from minority spokespersons, who pointed out that the children of the ethnic minority taxpayers were getting a second-class education because of language barriers and racist attitudes. The Supreme Court ruling in the Lau vs Nichols case emphasized that public school systems are required by federal law to take positive action to help non-English speaking children. Federally funded Title VII bilingual education programs began in 1969. After that, states passed legislation to fund bilingual programs (U.S. Commission on Civil Rights, Swanson 1974; Bilingual Educational Service Center, 1975). The bilingual program was established to make both languages vehicles for learning the content subjects. Using both languages for instruction was intended to make both languages legitimate and give children the opportunity to continue their cognitive and linguistic growth in their own language while acquiring English as a second language (Saville and Troike, 1971) as cited by Cohen.

Locally, bilingual education was established in 1972 for non-English speaking students. Bilingual education was accompanied by the English as a Second Language (ESL) program in a multi-grade level setting, based on the population in each school. In some instances there was single grade level for first and second grade and then multi-grade level in the rest of elementary

schools. In 1991, as a consequence of population growth, a modification to the program was introduced. The program was restructured by housing K-1 in one building, 2nd and 3rd in another building and finally 4th, 5th and 6th in a third building. This eliminated multi-grade levels. A New Comers Center was opened to provide a better alternative for the students who came for the first time to the district from their homeland.

Evaluation of the bilingual students has been based on the Language Assessment Battery-Spanish, Language Assessment Battery-English, and the Stanford standardized tests. They are given in the fall and spring to determine which students are ready to be mainstreamed in different subjects or can make the transition to the monolingual classroom.

Problem Evidence

Both subjective and objective data were used to document low comprehension and reading fluency of the first grade bilingual students. The Language Assessment Battery-Spanish is administered to all the first grade bilingual students in September of 1993. This instrument was selected because the district uses it to be in compliance with the rules and regulations of the Transitional Bilingual Education Program. The Language Assessment Battery-Spanish (L.A.B.-S.) is divided into three subtests; listening and speaking, reading, and writing. Table 1 presents data on the number of first-grade students whose raw scores place them in the percentile ranges listed.

Table 1

The Number of 1st Grade Students in Percentile Ranges

Language Assessment Battery-Spanish

Preintervention September, 1993

%ile	NUMBER OF STUDENTS
91st - 99th	00
81st - 90th	00
71st - 80th	00
61st - 70th	00
51st - 60th	02
41st - 50th	04
31st - 40th	04
21st - 30th	03
11th - 20th	12
0 - 10th	00
	N = 25

The data in Table 1 illustrate that 76 percent of the students fell below the 50th percentile. The data presented in table 1 revealed the need for improvement in listening and speaking, reading, and writing.

Figure 1 represents the number of students that fell within the percentile ranges shown on Table 1.

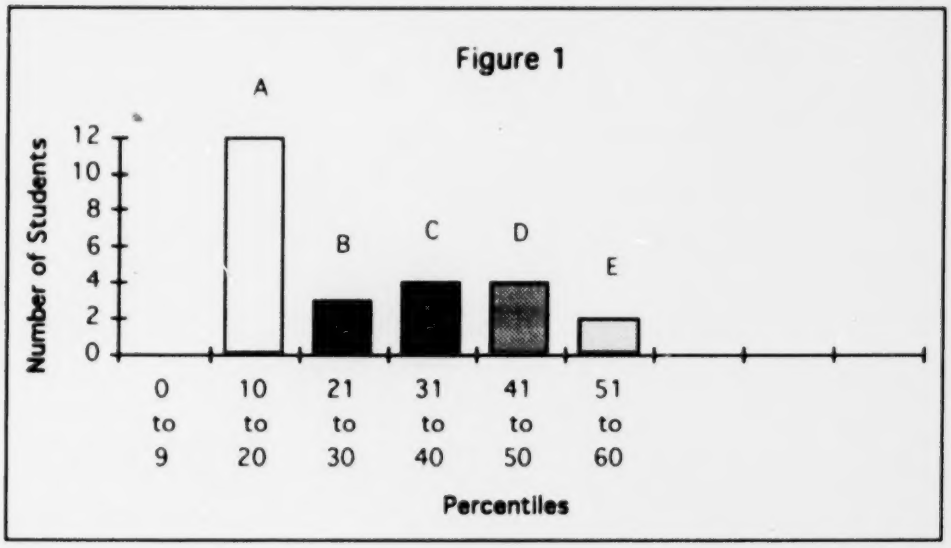

Figure 1

Summary of Findings in Percentile Ranges

of the L.A.B.S.

A - # of students who fell between the 10th and 20th percentile
B = # of students who fell between the 21st and 30th percentile
C - # of students who fell between the 31st and 40th percentile
D = # of students who fell between the 41st and 50th percentile
E = # of students who fell between the 51st and 60th percentile
F - # of students who fell between the 61st and 70th percentile

The data illustrates that 44 percent of the students fell between the 21st and 30th percentile. It is evident that 76 percent of the students fell below the 50th percentile. Aprenda: La pureba de logros in espanol was another instrument used to measure students' word recognition and reading comprehension. Aprenda was developed to assess Spanish speaking students on a norm-reference instrument. It was created to match the Stanford Achievement Test objectives. Aprenda is designed to measure cognitive learning of five, six, and seven year old children. This instrument is divided into five

subtests: sounds and letters, word reading, sentence reading, mathematics, and listening to words and stories (Psychological Corporation, 1990).

The test results presented here will focus on word and sentence reading. Word reading measures the students ability to match the spoken word to the print. Sentence reading is the first step to reading comprehension. This subtest assesses students' ability to comprehend simple sentences.

Figure 2 presents data on the number of students in raw score categories on the word recognition subtest of Aprenda.

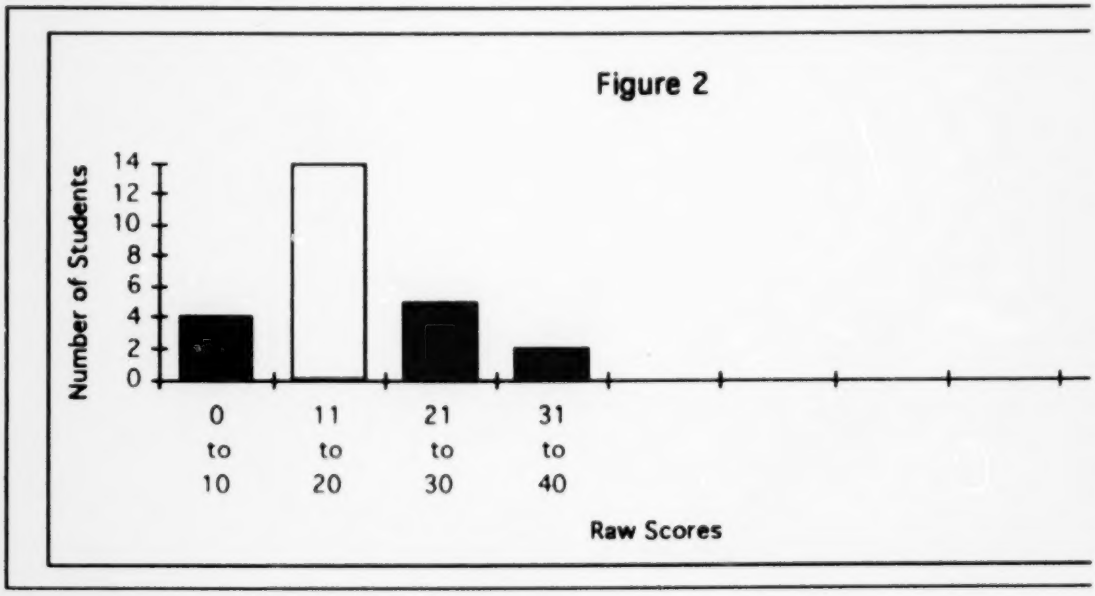

Figure 2

Number of students in Raw Score Categories on the Word Recognition Subtest of the Aprenda

Figure two illustrates that 16 of the 25 students received a raw score of 20 or below on the word recognition subtest of the Aprenda. Only nine of the

students could recognize between 21 and 30 words of the same subtest. Therefore, the first-grade bilingual students were having dificulty recognizing words at a first grade level.

Figure 3 illustrates the comprehension raw scores of the twenty-five first-grade bilingual students.

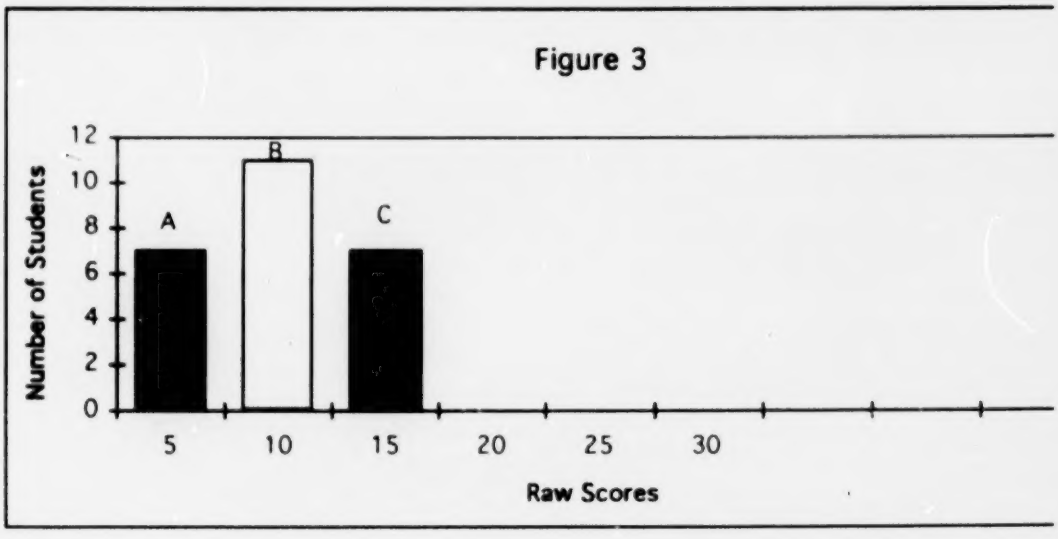

Figure 3

Summary of Findings of Comprehension
Raw Scores on the Aprenda
Range, 0 to 30

A = # of students whose raw score fell between 0 and 5
B = # of students whose raw score fell between 6 and 10
C = # of students whose raw score fell between 11 and 15

Figure three illustrates that seven of the 25 students had a raw score between 0 and 5, eleven had a raw score between 6 and 10, and seven of the students had a raw score between 11 and 15. Therefore, the data indicates that 100 percent of the students received a raw score of 15 or less out of a possible 30.

Fluency was recorded on individual cassettes. Each student was shown a story in one of the pre-primers. As the teacher pointed to the words, the student was to read the material for one minute. The results are as follows:

a) seven students did not respond to the text

b) nine students made up the story by looking at the pictures

c) seven students read the letters they knew

d) one student read 3 words.

e) one student read 7 words.

From these data, it is obvious that 64 percent of the students need to be made aware that the print tells the story not the pictures.

Subjective data collected included teacher observation of the students ability to relate the spoken word to printed material. During the taping of the fluency test, nine students looked at the pictures and told a story about the picture. These students did not look at the print as the teacher pointed to the words on the page. It was evident to the teacher that these student thought the picture told the story not the print.

Probable Cause of Problem

Data to indicate probable cause factors were gathered from anecdotal records. It was suspected that oral communication in the home was limited. The economic pressure on the parents to make a living was such, that there was no time to talk and share with the children. While both parents worked, the children went to a baby-sitter who placed them in front of the television, until the parents came for them.

During the last week in August, the parents were contacted by phone and an appointment made so that the child could be given the L.A.B.S. It was

discovered that 50 percent of the parents did not have a phone or the phone was disconnected.

The majority of the parents did not understand how the education system worked or what was expected from them. They did not get involved in their children's learning because they thought the teacher was the only one who could help the students. They did not see the connection between the school and the home. Not knowing the language makes it hard to communicate with the school personnel. Open House was held in September and only 32 percent of the parents attended.

In September, the students were given a book club order form along with a letter to the parents explaining the book club. Four students ordered books to read and five ordered coloring books. In October, they ordered seven books and five sets of Halloween stickers. These data has indicated that less than 30 percent of the students were ordering books to read for pleasure.

Probable cause data from the literature was categorized into deficiencies related to reading comprehension goals. These include: oral language development, exposure to print, attention to print, phonemic awareness, individual learning styles instruction and reading practice.

Oral language appeared to be a prerequisite to reading and writing according to Snow and Perlman (1985) as cited by Strickland and Morrow (1991). Anderson, Hiebert, Scott, and Wilkinson (1984) stated that for systematic reading instruction to occur, ample experience in oral language is required. They acknowledged that "Reading instruction builds especially on oral language. If this foundation is weak, progress in reading will be slow and uncertain" (p. 30).

Goodman (1986) and Mason (1980) viewed exposure to print as an important precursor to skilled reading. Davey and Menke(1991) agreed that print

knowledge is critical in the development of word recognition for reading comprehension to occur successfully.

To achieve reading comprehension, Clay (1979) suggested that children must learn to attend to the print. The eye does not photograph the detail of print and does not transfer it to the brain.

Eldredge (1990) found that poor readers cannot connect words and sentences in a meaningful way. One of the main reasons for this is that students tend to focus on small units of the word instead of larger units. Since fluent readers perceive phrases when reading and decode automatically, comprehension is proficient. Clay (1979) believes that students have a greater difficulty breaking up a word into sequence of sounds and hearing the sequence of sounds.

In 1988, Miller stated that reading problems may be caused by inappropriate reading instruction that does not take students' individual needs and weaknesses into account during instructional time. Carbo (1987) feels that too many students are victimized by the unspoken assumption that there is one right way to teach reading to all children.

> It comes as no surprise that many poor readers are predominantly global, tactile, and kinesthetic learners- for that is precisely the reading style that seems to be accommodated least in U.S. classrooms. Unfortunately, many of today's poor readers are dropouts of reading programs that demand strongly analytic/auditory reading styles (Carbo, 1987 p. 72).

In the opinion of Anderson, Hiebert, Scott, and Wilkinson (1984) students who read a lot showed larger gains in reading on achievement tests. In a study by Juel (1988) as sited by Kameenui (1993) it was noted that students who did not develop good word recognition skills in first grade read less than good readers both in and out of school.

Causes for the problem gathered from the site and the literature that appeared to be related to low comprehension scores are:

1. lack of fluency
2. lack of automatic word recognition
3. lack of oral language development
4. lack of exposure to print
5. lack of attention to the print
6. lack of phonemic awareness
7. lack of instruction for the individual learning styles
8. lack of reading practice
9. lack of available help from parents.

Chapter 3

THE SOLUTION STRATEGY

Review of the Literature

"The goal of skilled reading is effective, efficient construction of meaning or comprehension" (Davey and Menke, 1989 p.49)

What were the probable causes of low comprehension at the beginning of the first grade in a K-6 elementary school in a suburban community northwest of Chicago

Upon examination, limited word recognition and fluency appeared to be the prominent probable causes in this setting. The underlying causes appeared to be limited oral language communication in the home, limited exposure to print, limited educational background of the parents, misunderstanding of the educational system by the parents and limited parental involvement in the child's education.

Word recognition is the visual perception that occurs when the spelling pattern, the speech, and the meaning are connected automatically (Adams, 1991). "Fluency is an indicator that comprehension is occurring" (Schreiber, 1980) as cited by Sippola (p. 17).

The literature indicates that oral language development, exposure and attention to print, phonemic awareness, learning styles instruction and repeated practice, should be addressed as a component for the solution strategy for the low comprehension.

To address the improvement of the acquisition of reading comprehension, the following questions were addressed. Have the students developed oral language skills adequately to make comprehension of the text possible? Have the students been exposed to print enough to acquire the meaning of the text?

Have the students attended to the print to use the visual cues appropriately for comprehension? Have the students had difficulty in hearing and sequencing the sounds with the visual cues in order to read words for comprehension? Have the teachers exposed the students to a variety of learning style approaches to meet their individual differences to acquire reading comprehension? Have the students practiced reading sufficiently to improve comprehension of the text?

These questions indicate that the literature search should include: oral language development, exposure to print, attention to print, phonemic awareness, learning styles and repeated practice.

Oral language development appeared to be a significant component of reading acquisition. The data collected from the literature suggested that oral language acts as the catalyst for reading to occur easily for the students. Homes that communicate easily not only in spoken language but through reading and writing to the children, accelerate the reading process. The child develops the knowledge that print is just a written manifestation of oral language. Therefore, as cited in the literature, oral language development is truly fundamental to the reading process (Snow and Perlman, 1985; Teale, 1987; and Glazer, 1989; as cited in Strickland and Morrow, 1989).

In addition to these knowledgeable others, psycholinguistic experts as cited in Tadlock(1986) believe that students come to school with the language development to communicate their knowledge of the world. It is believed that this verbal communication makes reading possible. There are three systems that a student must access to read. They are the semantic, syntactic and graphophonic systems. Oral language is the way the good readers experience the semantic system in the early stages and later they connect it with the print to have the knowledge of grammar in their reading. Because of the syntactic system, the verbal communication relates to the aspects of words, sentences and paragraphs

for the transfer of meaning to the print. Because of the graphophonic system the student can relate the letters to the sounds although, truly fluent readers access this system only to confirm the predictions which are made by the other two systems. Through multi-exposure to oral language experiences, the students can access these three systems as part of the reading process.

Experts in the field emphasized that good oral language development is a pre-requisite for reading acquisition. According to Routman (1991) and Durkin (1986) there is a variety of techniques to enrich students' oral language development. These techniques include learning nursery rhymes, poetry, and songs. Through these techniques students will become accustomed to hearing the text and transfer it to the reading text. With some children, just repetition will be enough to learn to read. Others need to be shown that words begin with the same sound and exactly what a word is. Listening to the language first works not only for beginning readers but with older readers who have had difficulty with the reading process. Therefore, Routman, (1991) and Durkin, et al (1986) agree that oral language development impacts on the acquisition of reading.

Exposure to Print

Adams, (1990); Clay (1979); and Davey and Menke, (1991); state that exposure to print is fundamental in the development of reading. Even before formal instruction begins children need to understand that print communicates information not only about learning, but it is entertaining and it is a means of recording. They need to know the value of print in their lives. It is important for them to know how print works. Print is composed of meaningful units of spoken words, and words are units of letters. Research indicates that this is one of the most important aspects of fluent reading. Adams (1990) stated that students should be able to recognize letters, spelling patterns, and whole words visually and automatically in order to achieve comprehension.

When children entering first grade make the following observations that print is everywhere you go, that adults use print in different ways, and that print can be produced by anyone, then they can make the association that print symbolizes oral language and holds information that adults read. Students then have a solid ground for understanding the nature and uses of print. When children can do the above, then they have the most important tools to best learn reading and writing. The children who come to school without these tools can be helped by:

1. Showing them, when reading big books, that a string of letters are words and that there is a blank space to indicate that each string has its own meaning.
2. Showing them the correspondence between oral language and written language by observing that long strings of letters take longer to read than short strings of letters (The time of reading corresponds to the length of the string of letters).
3. Asking them to compare short and long words in context and decide which one corresponds with the pronounced word.
4. Expose them to Dr. Seuss books.
5. Cut and paste words that start with the same sound.
6. Use a dictionary to look up words.
7. Have centers with printed words of the story and have the story taped so the students can identify the words they hear while reading (Adams 1990).

Clay (1979) agrees with Adams (1990) and Davey and Menke (1991) that exposure to print is fundamental in the development of reading.

Attending to Print

According to Clay (1979) students are not actively engaged in the print and need to get involved in attending to the print. There are a variety of methods to assist the students to focus on the print. One method, Clay suggests, is a visual attending device which is known as a masking card that has windows to expose part of the text to be attended to. Cardinal, Griffin and Christenson

(1993) stated that tinted overlays also appear to assist the reader in attending to the print. Comprehension has been shown to improve through this technique.

Assisted reading appeared to be an important method to help the child with difficulties attending to the print. In an assisted method developed by Hoskisson, and described by Edlredge, (1988) a parent moved his/her finger slowly under the line of the text so that the child would attend to the print. After this process had been repeated, the child was eventually able to read the book. A similar method, as cited by Eldredge (1988) called the Neurological Impress Method, was developed by Heckelman (1969) to help the student with disabilities. Again the words were pointed to as the students and the adult or teacher read the text. The voice of the adult or teacher was directed to the student's ears. Sometimes the adult or teacher read louder and faster than the students and at other times just the opposite.

The research to date suggests the Attention Deficit Disorder students have a primary handicap of not paying attention to school. There is an indication that many of these children have problems with visual memory; this will give them great difficulty learning to read because what is read cannot be remembered (Friedman and Doyle, 1987).

Research shows that Attention Deficit students attend better over a longer period of time in front of the television. Eddowes and Eldredge (1991) suggest that this may be an important setting where the attention deficit child can learn.

Phonemic Awareness

As cited by Yopp, (1992) Perferpti, Bech, Bell, and Carter (1974) believed that phonemic awareness is both a prerequisite and causation of reading acquisition. Young learners must have a certain degree of phonemic awareness. Juel, (1986) Lomax and McGee (1987) believed that phonemic awareness is a strong predictor of reading comprehension acquisition.

In the opinion of Clay, (1979) children learn to read in the same manner that they learn to talk. The child must learn the spoken word and break it into phonemic pieces. To assist the learner in this task, counters could be used to represent every sound not every letter of the word. The child pushes counters into boxes to represent each sound of the word.

According to Clay, (1979) sound sequence and letter sequence analysis are two complex sets of operations that need to be coordinated to become fluent readers. When the students are unable to coordinate these two on their own, the teacher can assist them with these strategies.

Sounds to Letters: Ask the child what letters would be expected at the beginning, middle or end. Let the child reconstruct the word with magnetic letters; look at the word, run fingers across the word, close eyes and write it several times without looking; confirm the prediction of what the word would say in the text.

Letters to Sound: Ask the child to create a story and put the story in sentence strips. Because the sounds of the writing are instilled in the head of the child, the sounds will be a guide for reading. When a problem appears, help the child predict what the word will be by giving the first sound. Then give the child an opportunity to sound each letter and write it on the blackboard until the word would fit the context.

Clay et al agree to the importance of phonemic awareness in the acquisition of reading (1979).

LEARNING STYLES

Approaching reading through attention to different learning styles is not an innovative idea. Grossman, (1981) as cited by Thrope and Borden (1985), indicated that reading instruction has used multisensory techniques. Orton

(1937) and Gillingham (1965) stress phonics through the multisensory approach. Fernald (1943) used this approach but emphasized syllables and word parts.

> Children, like all living things- trees, leaves, plants, animals, adults- have individual differences. These individual differences need to be recognized by varying teaching procedures, learning experiences, uses of time and space as well as by careful selection and use of materials suitable for meeting the needs of the individual child (S.D. State Div. of Ed., 1986 p.5).

There are two perspectives concerning learning styles in children, one being modality preference and the other one being hemisphericity. Learners process information in their own way. Each learner has a dominant modality that is chosen to process new information. Although the multisensory technique has been used successfully, some researchers agree that matching individual modalities will bring success in reading. The three sensory channels are: visual, auditory, and kinesthetic/tactile. The visual learner relies on visual clues and in inward visualization; the auditory learner does not need visual stimuli, but learns from hearing; the kinesthetic/tactile learner needs to manipulate, touch and write to learn (L.S. Dept. of Ed., 1987). According to Carbo, (1993) modality preference is developmental. The primary years are more dominantly kinesthetic/tactile. Students are more visual at third grade, and auditory systems are more developed by sixth grade.

The other perspective that deals with learning style is right brain/left brain dominance. The right brain processes information from whole to part, and the left brain processes information from part to whole. Both hemispheres should be accessed for reading instruction, although traditionally reading skills development has emphasized the left-brain hemisphere in children (L.S. Dept. of Ed., 1987).

Tadlock, (1986) Miller, (1988) Aaron and Whitefield (1990) agree that the teachers should have knowledge of a variety of learning modalities and adapt the

environment to suit the needs of the learner's cognitive style. The learner should not be required to adapt to the teacher's instructional approach.

From the literature on learning styles as it relates to the ability to read, Carbo (1990) and Miller (1988) agree that beginning readers can make optimal gains through tactile/kinesthetic, visual and auditory approaches. Activities such as games, typewriters, computers, plays, pantomiming, drawing pictures, writing about them, and puppets all appeal to these learning styles.

Another facet of learning styles is the global (field dependent) and the analytic or (field independent) approach. As cited by Davey and Menke, (1991), in the study by Globenson, Weinsten and Sharbuny, (1985), field dependent (global) and field independent (analytic) learners performed similarly in the reading process when appropriate strategies for reading instruction matched their cognitive style. Global learners (field dependent) are whole-part learners whereas analytic learners (field independent) are part-of-whole learners. This is important to consider when designing reading instruction. Carbo (1990) emphasized that reading programs that work better for poor readers are the ones that implement global techniques such as humor, choral reading of stories, predictable patterned books, and listening to taped stories. All have helped the reader to improve reading and self-confidence. It is important to delete skill work for global learners and include high interest, well-written reading materials. Carbo (1987), suggests that reading lessons should begin with global strategies for the poor readers in the primary grades.

As cited by Dunn and Frazier (1990), in a study by Adams, (1983) Cafferty, (1980) and Mehdikani, (1980) academic achievement is evident in reading acquisition when the students learning style and the teachers instructional style are well-matched.

Practice

Many professionals such as Johns, (1991); Routman, (1991); Adams, (1990); Carbo, (1987); Clay, (1979); believe that one successful strategy for reading comprehension is repeated readings. Children develop word recognition, fluency, more accurate and faster reading, and more sophisticated textual paraphrasing through reading practice. Carbo, (1987) devised a repeated reading method that allows students to read books above their grade level with fluency and accuracy. The technique she used was to record books at a slower pace than the usual so that the students could synchronize the printed words. This method required the student to listen to the recorded passage two or three times. Then they would read it aloud to a peer or a teacher. This agreed with the findings of Eldredge and Quinn (1988). Children who are assisted made a substantial gain in reading stories.

Just reading material of their own choosing can empower students to be successful. A special daily reading period, just for reading these chosen materials, should be established in the classroom (Johns, 1991).

In a study by Anderson, Wilson, and Fielding (1988) there was a correlation between minutes per day of independent reading practice and the percentile rank on a reading standardized test; students who read independently 0 minutes per day, scored in the second percentile; those who read independently 9.2 minutes a day were in the 50th percentile and finally students who read 67.3 minutes scored in the 98th percentile. Therefore, Johns, (1991); Anderson, Wilson and Fielding, (1988) agree that reading practice is fundamental in the process of reading.

An additional solution that was addressed in the literature to assist students with the reading process was cross-age peer tutoring. An older student can assist younger students with reading activities. These activities could include

reading to the younger children or listening to them read orally. The tutoring can also include word recognition activities or independent seat work. These older students must be trained and supervised for the program to be successful. (Friedel and Boers 1989).

It was suggested by Neuman and Koskinen (1992) that captioned television benefits bilingual students in reading development and language acquisition. Significant differences in word recognition and oral reading skills were also documented in the learning disabled children who read the print captions on television with those that did not. It appeared to be that the multi-sensory component of captioned television allowed students to view context in interesting and stimulating ways. In a study by Chomski and Halliday, (1975), as cited by Neuman and Koskinen (1992), language is also acquired through a subconscious process. In other words, language acquisition occurs without any conscious effort.

A summary of the literature which addressed the questions for the acquisition of reading comprehension suggested the following strategies:

1. Shared reading in a variety of forms as nursery rhymes, poems and songs should be engaged in, on a daily basis.
2. Provide a print-rich environment through a variety of books, charts, periodicals, and calendars on a daily basis. Have centers with printed words of the story and have the story taped.
3. Use masking cards to expose segments of the text or group of units to be attended to daily.
4. Use tinted overlays to assist in reducing the contrast of printed material daily.
5. Track the text while listening to another person read.
6. Place counters in a square for every sound students hear, not letter. Use magnetic letters for sound cueing; use sentence strips for prediction of words in context.

7. Provide a variety of activities to accommodate the different learning styles in the teacher's lesson plans.
8. Use repeated reading and recorded books on a daily basis.
9. Provide a cross-age peer tutoring program.
10. Use captioned television to provide the essential environmental ingredients for language acquisition and reading development in the minority students and learning disabled students.

Project Outcomes

The terminal objective of this problem intervention was related to low automatic word recognition, fluency and comprehension skills. Test scores indicated that 76 percent of the students were below the 50th percentile on the Language Assessment Battery - Spanish. Solution strategies presented in the first part of this chapter, suggest the need for improving automatic word recognition, fluency, and comprehension. Therefore the following terminal objective is stated.

> As a result of using tactile and kinesthetic strategies within the whole language approach, during the first semester of the 1993-94 school year, the first-grade bilingual students will increase word recognition, increase reading ability and acquire reading comprehension skills, as measured by the Language Assessment Battery-Spanish (L.A.B.-S.), Aprenda and teacher made fluency tests.

In order to achieve the terminal objective, the following intermediate objectives describe the components of the proposed solution.

1) As a result of using gel boards to feel the sequence of letters in words and phrases, during the first semester of the 1993-94 school year, the first grade bilingual students will increase their word recognition as evidenced by teacher observation (Carbo and Thomasson, 1993).

2) As a result of using the Recorded Book Method, during the first semester of the 1993-94 school year, the first grade bilingual students will increase oral language, reading fluency and comprehension skills as evidenced by the teacher (Carbo, 1986).

3) As a result of using flip chutes and the language master, during the 1993-94 school year, the first grade bilingual students will increase word recognition, reading fluency and comprehension skills as evidenced by teacher made check lists (Carbo, 1986).

4) As a result of using body movement experiences to form letters and words, during the first semester of the 1993-94 school year, the first grade bilingual students will increase reading fluency and word recognition as evidenced by the teacher (Gilbert, 1977).

5) As a result of using the computer to write words and sentences from the reading series, during the first semester of the 1993-94 school year, the first-grade bilingual students will increase automatic word recognition as evidenced by the teacher (Carbo, 1990).

Proposed Solution Components

The major component of the learning style approach used to increase fluency, automatic word recognition and reading comprehension skills is the use of tactile/kinesthetic activities. These activities include; using body movement to learn letters and words, flip chutes to automatically read words, gel boards to feel the sequence of letters in a word, recorded books to listen to oral language that will enhance fluency and the computer to identify the sequence of letters in words and words in sentences. These components are related to the terminal objective in that they attempt to increase fluency, automatic word recognition and reading comprehension. Probable cause data indicated that oral language development, exposure to print, attention to print, and phonemic awareness are related to the low level of automatic word recognition and reading comprehension of the first grade bilingual students.

Chapter 4

ACTION PLAN FOR IMPLEMENTING THE SOLUTION STRATEGY

Description of Problem Resolution Activities

This action plan was designed to increase oral language, reading fluency, automatic word recognition and comprehension skills through the use of a learning styles approach. This approach addresses the needs of the first grade bilingual students who have not been read to, immersed in oral language and exposed to print. It was difficult for the students to recognize the connection between the oral language and print as part of the reading process.

This action plan was implemented in October 1993 after the pre-intervention assessment instruments were administered. These instruments included the Language Assessment Battery-Spanish (L.A.B.-S.), and Aprenda. As stated in chapter 3, most primary age students are tactile/kinesthetic (Carbo, 1990). This action plan was designed to meet the needs of the tactile/kinesthetic learner.

The improvement plan was structured and implemented through six study centers for two days a week, through daily body movement activities, and through the use of the language master during silent reading. The centers were placed throughout the first-grade bilingual classroom. Each center was introduced on a daily basis until all centers were in operation. The students were randomly selected to form four groups of four and one group of five. Each group was assigned a starting point. Then each group rotated every twenty minutes within a two hour time frame.

Each center is presented below and describes the reading comprehension goals.

1. Listening Center: The students listened twice to a story taped by the teacher. Then they read along with the tape. The

listening center will assist the student with oral language, fluency and word recognition (Carbo 1986).

2. Teacher as a Center: The students and teacher choral read the story. The story is then discussed at length and comprehension questions asked.
3. Computer Center: At this center the students will take turns writing vocabulary words and phrases. This will contribute to their awareness of sequence of letters in words, and word recognition.
4. Flip Chute Center: At this center the students take a card with a picture on one side and the word written upside down on the back. They place the card on the top slot of the chute. The card slides down the chute and comes out with the word side up (Carbo 1986). This will encourage automatic word recognition.
5. Gel Board Center: At this center each student has a set of vocabulary words and a gel board. With their index finger they trace the words onto the gel board (Carbo and Thomasson, 1993). This will encourage word recognition and phonemic awareness.
6. Individual Reading Center: At this center the students will select books of their choice to read silently. This will give them exposure to print and practice reading.

Two additional activities that will be implemented are body movement experiences and the use of the language master. Body movement experiences will be implemented daily for 15 to 20 minutes. The students will use their body to form letters and words (Gilbert, 1977). According to Miller, (1988) some students will make excellent gains in reading when the kinesthetic approach is used. During daily silent reading the students will take turns using the language master. The language master is a machine that the students can manually slide a card into to reinforce words and phrases from the reading series. Through the use of the language master, the student will access the tactile and kinesthetic modalities.

Method of Assessment

A variety of data collection methods will be used to assess the intervention plan. The Language Assessment Battery - Spanish, Aprenda and a fluency test designed by the teacher will be administered in January 1994. The fluency test will be recorded once a month to monitor each students' progress. The outcomes will then be compared to the data collected in September 1993.

Chapter 5

EVALUATION OF RESULTS AND PROCESS

Implementation History

The terminal objective of the intervention addressed the low level of word recognition, fluency and comprehension skills of the first grade bilingual students. Test scores from the fall, 1993 indicated that word recognition, fluency and comprehension skills were low. Therefore, the terminal objective stated:

> As a result of using tactile and kinesthetic strategies within the whole language approach, during the first semester of the 1993-1994 school year, the first-grade bilingual students will increase word recognition, increase reading ability and acquire reading comprehension skill, as measured by the Language Assessment Battery-Spanish (LAB-S), Aprenda, and a teacher made fluency test.

A tactile and kinesthetic component was added to the whole language approach, to address low automatic word recognition, low reading fluency and low comprehension skills of the first grade bilingual students. The intervention was developed when it was detected that previous first grade bilingual students were not achieving reading fluency at the conclusion of the academic school year and consequently, did not exhibit strong reading comprehension skills. The need for remediation was clear and it was determined that the principles of the learning styles movement would be combined with the whole language approach.

In the summer of 1993, the researcher made gel boards, (Appendix A) flip chutes, and recorded books from the reading series as well as other children's stories according to the literature in Chapter 4.

The improvement plan was structured to be implemented through six study centers for two days a week. On Mondays the teacher taught the whole group. Tuesdays and Wednesdays were center days. Each group had an assigned starting point. The children worked for 20 minutes then rotated to the next center. Thursdays and Fridays were whole group instuction days. Daily body movement

activities took place in the afternoon for 20 minutes. The language master was used during daily silent reading. Each center was introduced on a daily basis until all centers were in operation.

Each center is presented below and a description of what occurred during the practicum implementation. The centers each included four or five students.

1. Listening Center: This center was designed to assist the students with oral language, fluency, and word recognition. All were listening to the same story. The recording instructed them to listen to the story twice and follow along with their finger as the teacher read. Then they were to read along with the recording. Some students within the groups were very loud. It was discovered that they could not hear themselves read because of the headphones. But after practicing to read quietly, the children were able to read with the recording using their quiet voices.

2. Teacher as a Center: This center was designed to assist the students with oral language, phonemic awareness, fluency, word recognition and reading comprehension. The teacher used big books to achieve the above skills. The pictures in the story were discussed first to facilitate comprehension. Then the teacher read the story as she pointed to each word to assist the students in word recognition skills. Next the story was discussed using comprehension questions. Finally, the teacher read a page pointing to each word as the students repeated after her. In this way the teacher observed which students could recognize the words in the text. The following step also assisted students with word recognition. Two students were seated in front of the other two. The teacher revealed a word from the story on a flashcard, read it and the students repeated after her. The students were then instructed to look at the word and write it with their index finger on the back of the child that was seated in front of them. They were to say each letter sound as they wrote it. The children seated in front wrote

the word on the carpet. Then they closed their eyes and wrote the word in the air. This task seemed difficult. They wanted to open their eyes so that they could see the symbol that represented each sound. For the next word, the children switched positions. This procedure was repeated after every other word. Within two weeks of this procedure, the majority of the students seemed to write the words just by listening to the teacher say the word.

3. Gel Board Center: At this center each student had a set of vocabulary words and a gel board. With their index finger they traced the words onto the gel board as they said each letter sound. The objective of this center was to encourage word recognition and phonemic awareness. This center failed to meet its goal. The researcher noticed that the students were merely writing symbols onto the gel board. These symbols had no meaning, since the majority of the students did not read letters or words. They were writing words onto the gel board and at the same time talking about other areas of interest. After about ten minutes, the students were off task, and began to wander to other centers. Therefore, this center was combined with the teacher center. The students sat in two rows of four instead of the two rows of two. The front row now wrote on the gel boards instead of the carpet. This combination became more effective. Now all the children were on task.

4. Computer Center: This center encouraged the students to work on letter recognition, sequence of letters in words, and word recognition. Each student had a preassigned role, one was the typist, one the reader of the letters and the other two helped the typist find the letters on the key board. The students rotated the roles after each word so that each student had the opportunity to be the reader, typist and helper.

5. Flip Chute Center: This center provided the students with an opportunity to work on automatic word recognition. The students were to look at the picture on

the card, say the name of the picture, and place it on the top slot of the chute. The card would then slide out the bottom slot with the word printed on this side. Then, the students were to read the word. At the beginning, the students were more interested in watching the cards slide out the bottom chute, than in reading the words. Then they continued to play by counting to see how many cards they had collected. This was a difficult center to get started. But by the fourth time the center was used, the students were finally ready to stay on task.

6. Individual Reading Center: At this center the students selected books to read silently. This provided them with exposure to oral language, exposure to print and gave practice in reading. Since the children could not read, they only looked at the pictures and discussed them with each other. This center did not meet the needs of the students. Therefore, this center was modified. The teacher provided the students with individual cassette players and headphones. The teacher recorded books from the individual reading center. Now the students could select a book and listen while they looked at the picture. They were instructed to listen a second time while placing their index finger under each word. After listening to a story twice, they were allowed to select another story.

Another tactile and kinesthetic activity that was implemented was body movement experience. Body movement experiences were performed three times a week in a 20 minute time slot. The students used their bodies to form letters and words. They either worked alone or with a partner depending on how they wanted to illustrate the letter or word being shown. At the beginning, the teacher used letter cards. Later these cards were exchanged for simple vocabulary words. First the teacher showed the symbol of a letter. Then each child was to make that letter with his/her body. Sometimes the children used the floor to make letters, especially capital letters.

The last activity of this project was the use of the language master. The students rotated the use of the language master during silent reading time. The language master accessed the visual, tactile, auditory, and kinesthetic modalities within the child.

Presentation and Analysis of Project Results

In order to assess the effects of the intervention plan the Language Assessment Battery-Spanish (LAB-S), Aprenda, and a fluency test designed by the teacher were administered in February 1994. The results of the pre and post tests of the Language Assessment Battery-Spanish are presented in appendix B and summarized in table 2.

Table 2

The Number of 1st Grade Bilingual Students in Percentile Ranges Pre & Post Language Assessment Battery-Spanish Sept. 1993 and Feb. 1994

%ile	Pre	Post
91st - 99th	00	09
81st - 90th	00	03
71st - 80th	00	05
61st - 70th	02	03
51st - 60th	04	00
41st - 50th	03	01
31st - 40th	02	01
21st - 30th	06	00
11th - 20th	05	00
0th - 10th	00	00
	N = 22	N = 22

Three of the students moved out of district. There are 22 students participating in this intervention plan.

After the L.A.B.-S. pre test was given in September, 6 of the 22 students scored above the 50th percentile. The results of the post L.A.B.S. indicate that 20 of the students scored above 50th percentile. This is an increase of 14 students who scored above the 50th percentile. Three students received a

perfect score, while six missed only one. This placed them in the 91st - 99th percentile range. The data from the Language Assessment Battery-Spanish indicate pre to post test improvement in the areas of listening and speaking, reading, and writing.

Table 3 summarizes data for the word recognition subtest of the Aprenda. The results of the pre and post tests for word recognition and comprehension skills are presented in appendix C.

Table 3

The Number of 1st Grade Bilingual Students
and the Raw Score Ranges Pre & Post
Word Recognition on the Aprenda
Sept. 1993 and Feb. 1994

Raw Score	Pre	Post
31-40	02	16
21-30	07	03
11-20	11	03
0-10	02	00
	N = 22	N = 22

Data indicate that 16 of the 22 students received raw scores between 31 and 40 on the post test. Where as only 2 of the students received raw scores between 31 and 40 on the pretest given in September 1993. This indicates that 14 of the students increased their word recognition skills. Eleven of the 22 students had a raw score between 11 and 20 in September, while only 3 students received that score in February 1994. That is a decrease of eight students. Overall, the number of students that can recognize more than 20 words increased by 10 students.

Table 4 summarizes data for the comprehension subtest of the Aprenda.

Table 4

The Number of 1st Grade Bilingual Students
and the Raw Score Ranges Pre & Post
Comprehension on the Aprenda
Sept. 1993 and Feb. 1994

Raw Score	Pre	Post
21-30	00	13
11-20	06	06
0-10	16	03
	N =22	N = 22

The data in Table 4 demonstrate that 13 of the 22 students received raw scores between 21 and 30 on the post comprehension test, while no one score fell within that range on the pre test. In September, the majority of the students, 16 of the 22, fell within the bottom range of 0-10. After the post test in February of 1994, the majority of the students, 13 of the 22, scored at the top range of 21-30. Data incdicate that the first-grade bilingual students made progress on the comprehension subtest of the Aprenda.

Fluency was recorded on individual cassettes (Appendix D). The students read for one minute from the same pre-primer that was used in September 1993. The researcher listened to each recording and then counted the words. The results are as follows:

a) one student read 44 words per minute

b) eleven students read between 15 and 40 words per minute

c) six students read between 4 and 14 words per minute

d) one student had no response

e) one student tried to sound out the words; either by letter sounds or by syllable

f) two students looked at the picture and told the story

In September none of the students read with fluency, after the intervention, 18 of the students are reading fluently. During the pre test in

September, seven of the students did not respond to the text. During the post test in February only one of the students did not respond. Therefore, six more students are reading fluently. In the fall of 1993, nine of the students made up the story by looking at the picture. During the post test only two students told the story by looking at the pictures. The fluency test illustrates that seven more students learned that the print , not the pictures, tells the story.

In summary, the strategies employed to increase low automatic word recognition, comprehension skills, and fluency of the first-grade bilingual students were successful. In September 1993 only nine of the students knew some letter sounds, five months later 14 of the 22 students are reading with comprehension.

Reflections and Conclusions

The project increased the overall reading achievement of the first-grade bilingual students. While 14 of the 22 students learned to read at the first grade level in five months, eight are in need of further interveniton. Of these eight , four know the letter sounds. They need more time to practice reading. It is hoped that by continuing with this intervention for three more months four of the remaining eight students will gain five months in their level of reading. It is apparent that the four students having problems in reading are also low in oral language. The data in Appendix B demonstrate that the students who scored below the 50th percentile on the Language Assessment Battery-Spanish are the same students that scored at the bottom range on the word recognition and comprehension subtests on the Aprenda (Appendix C). It is hoped that by continuing with this intervention for three more months the other eight students will gain five months in their reading level. Children develop at different rates and these eight children might not have been ready to learn to read in September. At the end of the 1993-94 school year at least 86 percent of the

first grade bilingual class will be leaving first grade prepared to read 2nd grade material with comprehension.

Chapter 6

DECISIONS ON THE FUTURE

The data indicate that a tactile and kinesthetic component within the context of a whole language approach to reading should be continued. However, it is suggested that modifications of the original plan be made.

The first modification that should be made concerns the use of the gel board. The gel board should be used with adult supervision until such time that students are able to identify letter sounds. Once students learn the letter sounds, they will be able to use the gel on their own. In this manner, children are able to get the full benefit of feeling the letter or word as they are writing. When a child writes a letter or word, it is recommended that they say the sound of each letter as they are writing.

The second modification concerns the use of the flip-chute. The students need to be given time to play with the flip-chutes and cards before actual implementation is begun. With these two modifications, implementation of the intervention plan will be easily facilitated

A major focus of this intervention was to send bilingual first-grade students on to second grade with the ability to read and dcomprehend stories at the second grade instuctional level. It was hoped that through this practicum, the possibility of bilingual students being at-risk would be decreased. This would lead them to have self-confidence in their reading, appreciate literature and learn from the world around them.

Additional Applications

Another part of the curriculum that would benefit from the tactile and kinesthetic approach would be the reading part of math. So many bilingual children enter first-grade not knowing how to read numerals. They are able to

count objects but have difficulty matching the numeral with the objects, especially double-digit numerals. This would be worth investigating.

Dissemination of the Data and recommendations

As part of the bilingual team all bilingual teachers should be aware of the impact that tactile and kinesthetic modalities have on students. Children who are at-risk in a traditional setting need an alternative method of learning. This plan could be modified and integrated at all grade levels across the curriculum. It was noted in the literature in Chapter 3 that primary (K-2) students tend to be tactile/kinesthetic. Therefore, all primary teachers would benefit from this plan. This data needs to be shared with asministrators, so they will not be surprised when they stop in for a visit and see the children lying on the floor forming letters, writing on each other's back, playing with gel boards or moving around freely in the classroom forming letters and words. This Action Research Project has confirmed the importance of using alternative methods of teaching reading to children at-risk.

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APPENDICES

Appendix A

Gel Boards

From Conference given by M.Carbo, R. Thomasson, & K. Christian

1993

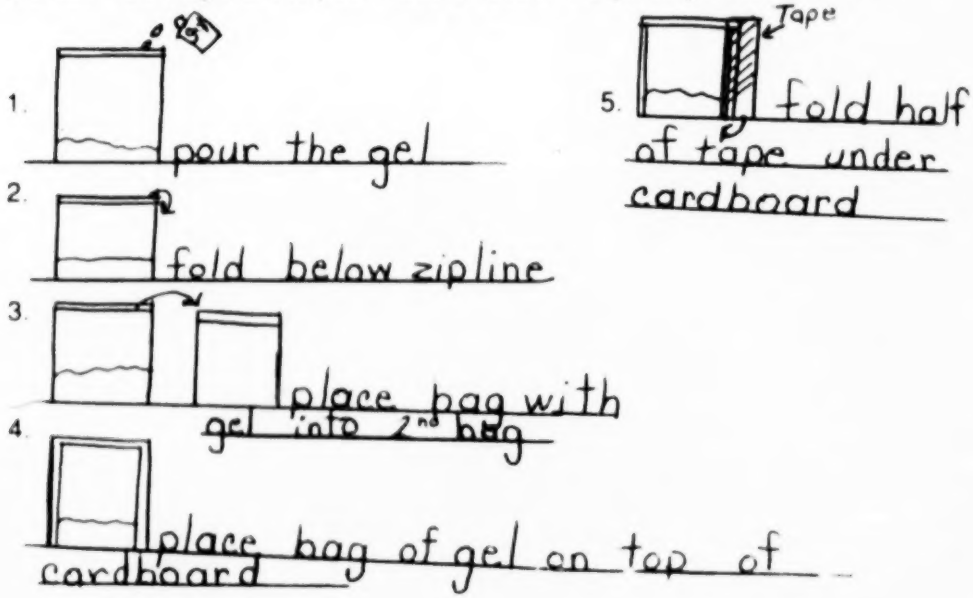
Materials needed for one gel board:

2 freezer ziplock bags (Gallon size)
8 oz. styling gel
duck tape
11" X 12" heavy cardboard
scissors

Directions:

1. Pour the styling gel into one of the bags. Squeeze all the air out and zip shut.
2. Fold the top part of the bag just below the zip line.
3. Place this bag inside the second bag, squeeze the air out and zip it.
4. Place the bags of gel on top of the cardboard.
5. Cut 11" of the tape, place the tape along one edge of the bag.Leave about 1 /2" of tape along the edge so that it can be folded under the cardboard.
6. Tape the other 3 sides the same way.

NOTE: You may want to pour more or less of the jel as you see the need.



Appendix B

Language Assessment Battery-Spanish

Pre and Post Data Results in Percentiles

First Grade Bilingual Students 1994

STU. #	PRE	POST
1	25	94
2	55	94
3	20	76
4	20	71
5	29	76
6	51	99
7	35	90
8	68	90
9	41	76
10	51	94
11	20	41
12	16	62
13	25	78
14	46	94
15	25	99
16	51	68
17	41	99
18	29	78
19	35	90
20	20	94
21	62	94
22	25	35

Appendix C

Aprenda Word Recognition and Comprehension

Test Results Pre and Post Test Data in Raw Scores

STU. #	WORD RECOGNITION		COMPREHENSION	
	PRE	POST	PRE	POST
1	15	36	11	30
2	20	40	7	24
3	11	33	6	11
4	14	30	6	15
5	25	31	11	8
6	21	39	8	29
7	1	37	0	28
8	31	40	11	28
9	14	22	9	7
10	21	40	11	25
11	13	20	4	9
12	3	20	0	11
13	13	32	2	27
14	22	40	13	28
15	29	40	8	22
16	14	18	13	11
17	17	39	9	25
18	19	34	8	13
19	22	33	6	22
20	26	38	9	28
21	32	38	8	28
22	14	23	6	18

Appendix D

Words per Minute on Teacher Made

Fluency Test

STU#	PRE	POST
1	0	17
2	0	14
3	0	5
4	0	5
5	0	4
6	0	30
7	0	30
8	7	40
9	0	10
10	0	23
11	0	0
12	0	0
13	0	26
14	0	40
15	3	21
16	0	0
17	0	24
18	0	10
19	0	30
20	0	44
21	0	20
22	0	0